Shore-based Path Planning for Marine Vehicles Using a Model of Ocean Currents (SBPP)

Completed Technology Project (2015 - 2017)

Project Introduction

Develop path planning methods that incorporate an approximate model of ocean currents in path planning for a range of autonomous marine vehicles such as surface vessels, subsurface vehicles, vertically profiling floats and gliders.

The goal of the path planning software is to develop a plan of control directives that when executed by a marine asset in an actual ocean current field will cause the marine asset to follow a template path relative to an ocean feature of science interest, where a template path is a series of edges between waypoints. As an example, templates can go from one corner of a 15km x 15km box to the opposite corner. Nominally this path should take 24 hours to complete. Ideally the asset would perfectly follow the line but in reality the asset should follow the line as closely as possible and achieve the endpoint within 0.5 km.

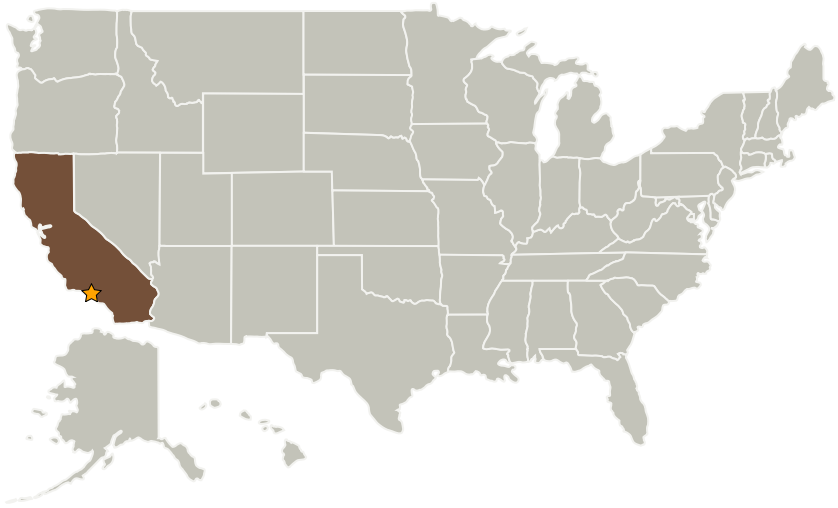
Anticipated Benefits

Increased ability to measure Earth ecosystems, to understand environment and climate among other things.

Increase general autonomy technology available for commercial space ventures.

Increased ability to measure ocean ecosystem - benefits to NOAA, USN, and USGS.

Primary U.S. Work Locations and Key Partners



Seagliders being deployed.

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Independent Research & Development: JPL IRAD

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Images

JPL_IRAD_Activities Project Image
Seagliders being deployed.
(https://techport.nasa.gov/image/26142)

Project Management

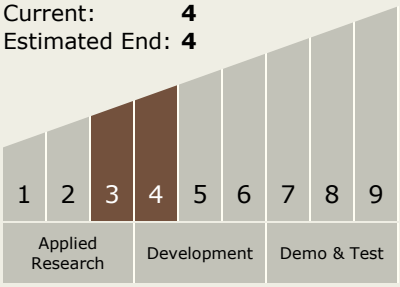
Program Manager:
Fred Y Hadaegh

Project Manager:
Fred Y Hadaegh

Principal Investigator:
Steve A Chien

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.3 Motion Planning